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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

14

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference DM/LD/P10367PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/00314	International filing date (day/month/year) 03/02/2000	Priority date (day/month/year) 03/02/1999
International Patent Classification (IPC) or national classification and IPC E21B4/00		
Applicant ROTECH HOLDINGS LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 09/08/2000	Date of completion of this report 19.04.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Str mmen, H Telephone No. +49 89 2399 7345



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I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-11 as originally filed

Claims, No.:

1-34 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:

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the drawings, sheets:

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 5-6, 12, 14-22, 25-34
	No:	Claims 1-4, 7-11, 13, 23-24
Inventive step (IS)	Yes:	Claims 20-22, 31-34
	No:	Claims 1-19, 23-30
Industrial applicability (IA)	Yes:	Claims 1-34
	No:	Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

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Reference is made to the following documents:

- D1: CH 239 592 A
- D2: GB-A-1 344 318
- D3: US-A-5 074 681
- D4: US-A-1 448 189

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

V-1 With respect to claim 1, D1, which is considered the closest prior art, discloses:

- A bearing assembly having at least two bearing elements (page 1, left col., l. 2-3) spaced by a first body, the first body having means for flexing (page 1, left col., l. 16-19).

Therefor the subject-matter of independent claim 1 is not new in the sense of Article 33(2) PCT.

V-2 Furthermore, D1 discloses the content of the following claims of the present application:

- | | |
|-------------------|--|
| Claim 2: | Page 1, left col., l. 19-22. |
| Claim 3: | Page 1, left col., l. 19-21. |
| Claim 4: | Page 1, right col., l. 1-4. |
| Claim 7,8: | Fig. 1, see track in item 5 for ball 3 or 4. |
| Claim 9: | Fig. 1. |
| Claim 10: | Page 1, right col., l. 5-7, i.e longitudinal loading will mean flexing in the same axis. |
| Claim 11: | Page 1, right col., l. 1-4. |
| Claim 13, 23, 24: | Implicitly disclosed. |

Therefor the subject-matter of independent claims 2-4, 7-11, 13 and 23-24 is

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not new in the sense of Article 33(2) PCT.

V-3 The problem solved by the additional features in claim 5 is to avoid stress concentrations in the groove due to axial loading. It is however known from basic mechanical principles that a rounded finish solves the said problem (see D2, fig. 1, item 15), and therefore the skilled man will find it obvious to modify the spacer of D1 accordingly.

Therefore, the subject-matter of dependent claim 5 does not involve an inventive step and the claim does not satisfy the criterion set forth in Article 33(3) PCT.

V-4 D3 discloses in fig. 4, a first body 204 which is spacing the two bearings 222 and 224. This first bearing 204 is rigidly mounted to body 214 to which load is applied, in use. As it is therefore known to load a bearing assembly by loading directly the spacer between bearing elements, it would be an obvious possibility to modify accordingly the device of D1.

Therefore, the subject-matter of dependent claim 6 does not involve an inventive step and the claim does not satisfy the criterion set forth in Article 33(3) PCT.

V-5 As it is not clear which technical features should distinguish the subject-matter of claim 12 from the one of claim 1 (see point VIII-1), the subject-matter of claim 12 can also not be considered to be new in the sense of Article 33(3) PCT.

V-6 With reference to claims 14 to 19 it is known to use multiple bearing assemblies in series for increasing the resistance to lateral flexibility of mutually rotating parts, see for example fig. 4 of D3. As claims 14 to 19 seems to specify nothing more than conventional ways for separating bearing assemblies, none of said claims meets the inventive step requirement of Art. 33(3) PCT.

V-7 The features of claims 20 to 22 are not known or suggested by any of the

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cited documents, and therefore said claims meet the requirements of Art. 33(3) PCT. The same conclusion applies also to claims 31 to 34.

- V-8 Once the advantages of a bearing assembly as in D1 are known, it would be an obvious possibility to use it in a downhole tool, and in particular a drilling assembly. Claims 25 and 26 do not meet therefore the inventive step requirement of Art. 33(3) PCT.
- V-9 The features of claims 27 and 29 correspond to the ones of claims 6 and 16, and therefore also claims 27 and 29 do not meet the inventive step requirement of Art. 33(3) PCT.
- V-10 Bearings are routinely used in combination with a concentrical central shaft and a concentrical outer housing (see for example D4, fig. 3). Therefore, the features of claims 28 and 30 do not involve an inventive step (Article 33(3) PCT).

Re Item VII

- VII-1 Independent claims 1 and 12 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- VII-2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.
- VII-3 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- VII-4 It appears, that due to a typographic misprint, the number "27" in claim 27, should read "26".

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- VII-5 It appears, that a typographic misprint is present in dependent claim 31 where claim 24 has been referenced twice.
- VII-6 The units of measure employed on page 8, l. 3 "Inch" of the description is not additionally expressed in terms of the units stipulated by Rule 10.1(a) PCT.
- VII-7 The units of weight employed on page 9, l. 28 "1bf" of the description is not additionally expressed in terms of the units stipulated by Rule 10.1(a) PCT.

Re Item VIII

Certain observations on the international application

- VIII-1 The relative term "partly" used in independent claim 12 has no well-recognised meaning and leave the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear (Article 6 PCT).
- VIII-2 The embodiment of claim 20 implies the presence of at least two "first bodies". However, claim 20 is formulated as dependant from claim 13, where it is specified that the bearing unit comprises "at least **one** bearing assembly" and therefore only one "first body". Claim 20 is therefore not clear. A similar objection applies also to claim 21.



US Serial No. 09/890,714
Hector Filippus Alexander Van Drentham-Susman.
THRUST BEARING FOR DOWN-HOLE TOOL

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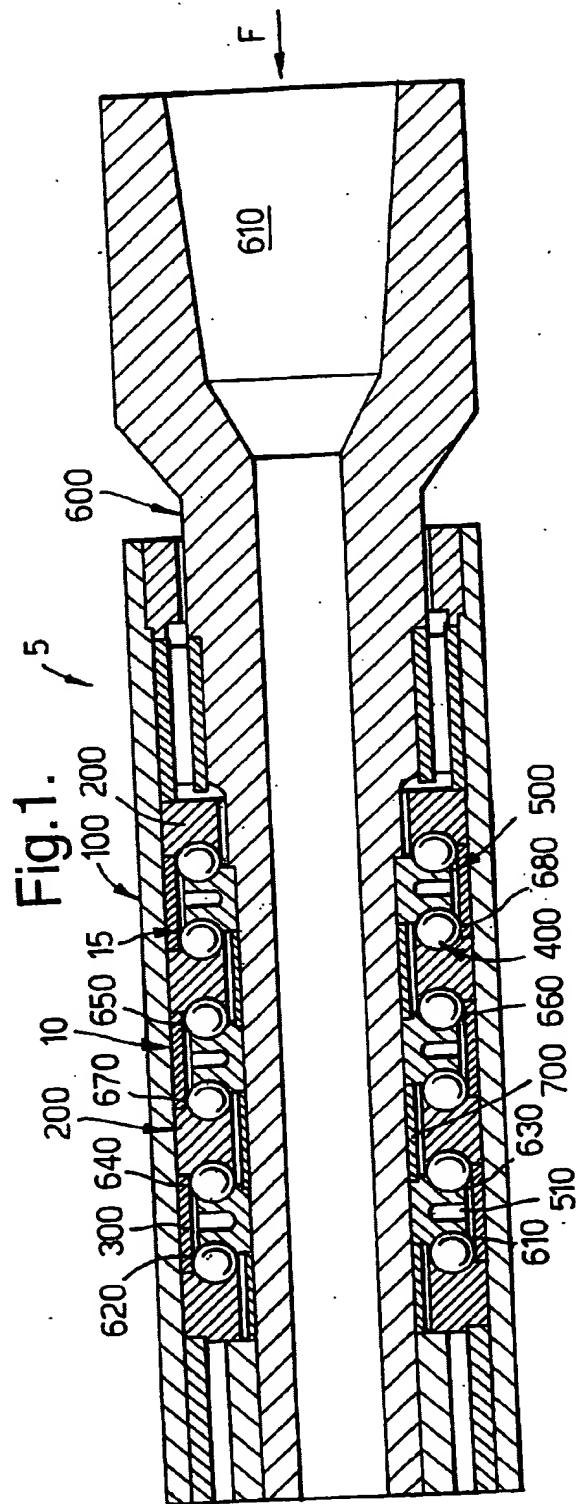


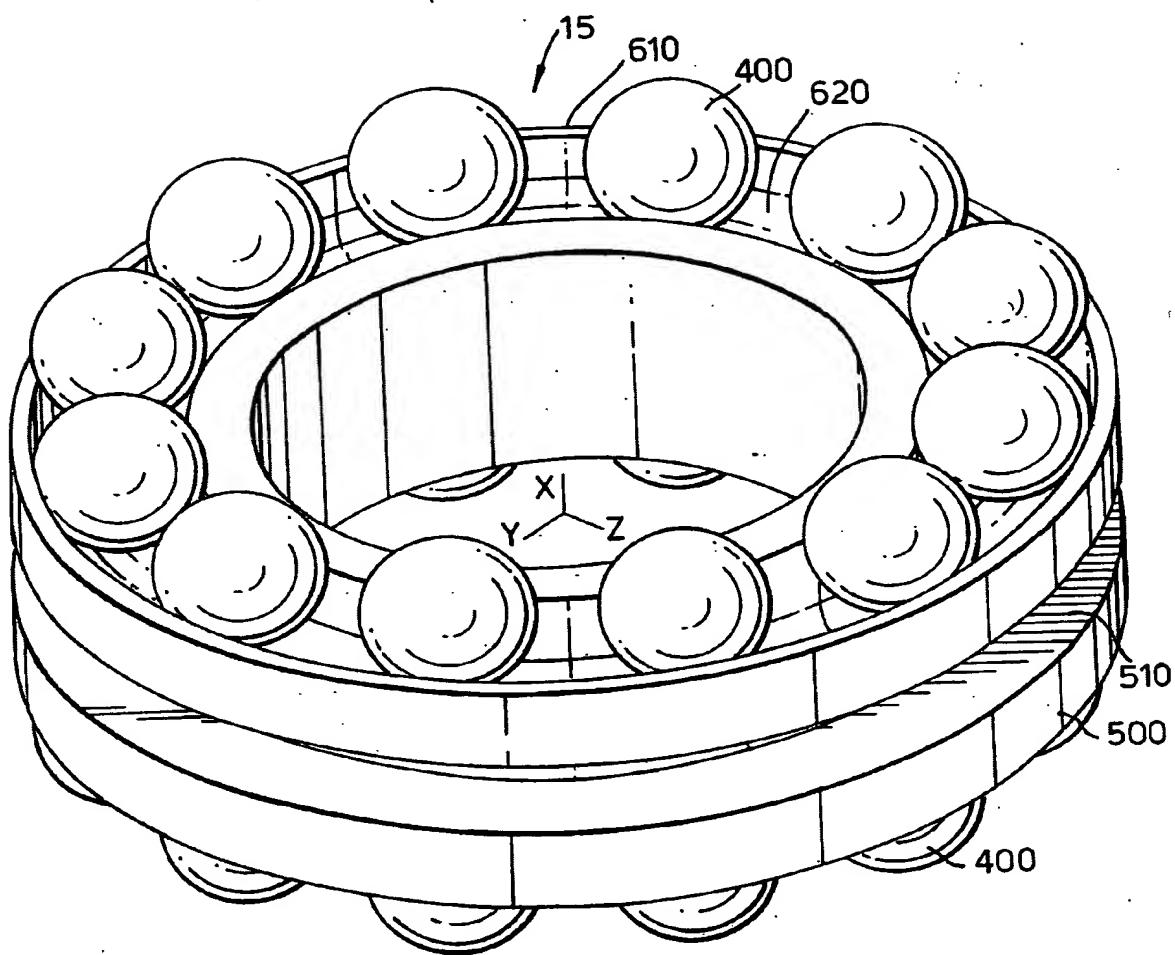
Fig. 1.



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Fig.2.



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